DETAILED ACTION

Status of the Claims

Claims 1-4, 6-18 and 22-25 are pending wherein claims 1-4, 6-14 and 16-17 are amended, claims 5 and 19-21 are canceled, and claims 22-25 are new.

Status of Previous Rejections

The previous rejection of claims 1-4 and 6-10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention is withdrawn in view of the Applicant's amendment to claim 1. The previous rejection of claims 1, 3-4 and 6-10 under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (US 5,562,786) in view of Koehler (US 3,561,087) is withdrawn in view of the Applicant's amendments to claims 1-2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4, 6-18 and 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (US 5,562,786) in view of Koehler (US

3,561,087), and further in view of Schladitz (US 3,343,953).

In regards to claim 1, Hayashi et al. ('786) discloses a ring-shaped, sintered steel material that would have application such as use in automotive parts comprising a composition relative to that of the instant invention as shown in the table below (col. 1, lines 22-27, col. 3, line 50 – col. 4, line 5 and Example I).

Element	From Instant Claims (weight percent)	Hayashi et al. ('786) (weight percent)	Overlap (weight percent)
C	0.4 – less than 1.3	0.2 – 1.6	0.4 – less than 1.3
Si	0.1 – 3.0	0 – 1	0.1 – 1.0
Mn	0.1 – 3.0	0 – 4	0.1 – 3.0
Cr	0 – 0.50	0 – 6	0 – 0.50
Ni	0.05 – 3.0	0 – 6	0.05 – 3.0
Al	0.7 – 2.0	0 – 2	0.7 – 2.0
Mo+W+V	0.3 – 20	0 – 11	0.3 – 11
Cu	0.05 – 3.0	0 – 4	0.05 – 3.0
Fe	remainder	remainder	remainder

The Examiner notes that the composition disclosed by Hayashi et al. ('786) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of carbon, silicon, manganese, chromium, nickel, aluminum, molybdenum, tungsten, vanadium and copper from the amounts disclosed by Hayashi et al. ('786) because Hayashi et al. ('786) discloses the same utility throughout the disclosed ranges.

Hayashi et al. ('786) discloses a ring-shaped, sintered steel material having a composition as shown above, but Hayashi et al. ('786) does not

distinctly specify forming the steel composition into a piston ring.

Koehler ('087) discloses that piston rings formed by powder metallurgical methods such as sintering allows for the piston ring to bear tightly against the cylinder during operation and operate under higher tangential stress (col. 1, lines 40-57 and col. 2, lines 37-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the ring-shaped sintered steel material, as disclosed by Hayashi et al. ('786), as the piston ring, as disclosed by Koehler ('087), in order to allow for a piston ring to bear tightly against the cylinder and operate under higher tangential stress, as disclosed by Koehler ('087) (col. 1, lines 40-57 and col. 2, lines 37-48).

With respect to the amended recitation "wherein graphite particles having an average particle size of not more than 3 μm are present in a section of a metal structure of the steel" of claim 1, Hayashi et al. ('786) in view of Koehler ('087) discloses a piston ring made of sintered steel material and using graphite powder (Examples 1-2 of Hayashi et al. ('786) and Example of Koehler ('087)), but neither Hayashi et al. ('786) nor Koehler ('087) specify the size of the graphite powder.

Schladitz ('953) discloses inserting metal encapsulated graphite and/or metal encapsulated sulfide into metal interconnections wherein the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron in order to lower material wear and prevent premature deformation (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71

and claim 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal encapsulated graphite and/or metal encapsulated sulfide, as disclosed by Schladitz ('953) into the piston ring made of sintered steel material, as disclosed by Hayashi et al. ('786) in view of Koehler ('087), in order to lower material wear and prevent premature deformation, as disclosed by Schladitz ('953) (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

In regards to claim 2, Schladitz ('953) discloses that once the lubricant (graphite, metal sulfide) is expended, sliding properties would deteriorate (col. 1, lines 35-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the amount of lubricant in order to prevent premature deterioration of sliding properties. MPEP 2144.05 II.

Still regarding claim 2, Schladitz ('953) discloses that the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

In regards to claim 3, Hayashi et al. ('786) does not necessitate the addition of vanadium to the steel alloy because "Si, V, and Al each in an amount up to 1 wt %" would include 0 wt% (col. 4, lines 1-5).

In regards to claim 4, Hayashi et al. ('786) discloses up to 8 weight

percent molybdenum and up to 2 weight percent tungsten (col. 3, line 64 – col. 4, line 5), which overlaps the range of 0.3 to 0.5 weight percent molybdenum and tungsten as instantly claimed. Hayashi et al. ('786) does not necessitate the addition of vanadium to the steel alloy because "Si, V, and Al each in an amount up to 1 wt %" would include 0 wt% (col. 4, lines 1-5).

In regards to claim 6, Hayashi et al. ('786) discloses up to 8 weight percent molybdenum (col. 3, line 64 - col. 4, line 5), which reads on the range of 1.5 to 3.0 weight percent molybdenum.

In regards to claim 7, Hayashi et al. ('786) discloses up to 2 weight percent cobalt (col. 4, lines 1-5), which reads on the range of not more than 10 % of Co.

In regards to claims 8-9, Hayashi et al. ('786) does not necessitate the addition of sulfur or calcium. Hayashi et al. ('786) therefore meets the claim limitations of "not more than 0.3% S" and "not more than 0.01% Ca" because "not more than" would include 0%.

In regards to claim 10, Hayashi et al. ('786) discloses subjecting the steel to a nitrogen gas atmosphere at elevated temperature (nitriding) (Examples 1-2).

In regards to claims 24-25, Hayashi et al. ('786) discloses 0 to 6 weight percent chromium, which encompasses the ranges of 0 to 0.3 weight percent chromium as in claim 24 and 0 to 0.25 weight percent chromium as in claim 25 (col. 3, line 50 – col. 4, line 5).

In regards to claim 11, Hayashi et al. ('786) discloses a ring-shaped,

sintered steel material that would have application such as use in automotive parts comprising a composition relative to that of the instant invention as shown in the table below (col. 1, lines 22-27, col. 3, line 50 – col. 4, line 5 and Example I).

Element	From Instant Claims (weight percent)	Hayashi et al. ('786) (weight percent)	Overlap (weight percent)
C	0.4 – less than 1.3	0.2 – 1.6	0.4 – less than 1.3
Si	0.1 – 3.0	0 – 1	0.1 – 1.0
Mn	0.1 – 3.0	0 – 4	0.1 – 3.0
Cr	0 – 0.50	0 – 6	0 – 0.50
Ni	0.05 – 3.0	0 – 6	0.05 – 3.0
Al	0.7 – 2.0	0 – 2	0.7 – 2.0
Mo+W+V	0.3 – 20	0 – 11	0.3 – 11
Cu	0.05 – 3.0	0 – 4	0.05 – 3.0
Fe	remainder	remainder	remainder

The Examiner notes that the composition disclosed by Hayashi et al. ('786) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of carbon, silicon, manganese, chromium, nickel, aluminum, molybdenum, tungsten, vanadium and copper from the amounts disclosed by Hayashi et al. ('786) because Hayashi et al. ('786) discloses the same utility throughout the disclosed ranges.

Hayashi et al. ('786) discloses a ring-shaped, sintered steel material having a composition as shown above, but Hayashi et al. ('786) does not distinctly specify forming the steel composition into a piston ring.

Koehler ('087) discloses that piston rings formed by powder metallurgical

methods such as sintering allows for the piston ring to bear tightly against the cylinder during operation and operate under higher tangential stress (col. 1, lines 40-57 and col. 2, lines 37-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the ring-shaped sintered steel material, as disclosed by Hayashi et al. ('786), as the piston ring, as disclosed by Koehler ('087), in order to allow for a piston ring to bear tightly against the cylinder and operate under higher tangential stress, as disclosed by Koehler ('087) (col. 1, lines 40-57 and col. 2, lines 37-48).

Hayashi et al. ('786) in view of Koehler ('087) discloses a piston ring made of sintered steel material and using graphite powder (Examples 1-2 of Hayashi et al. ('786) and Example of Koehler ('087)), but neither Hayashi et al. ('786) nor Koehler ('087) specify the size of the graphite powder.

Schladitz ('953) discloses inserting metal encapsulated graphite and/or metal encapsulated sulfide into metal interconnections wherein the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron in order to lower material wear and prevent premature deformation (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal encapsulated graphite and/or metal encapsulated sulfide, as disclosed by Schladitz ('953) into the piston ring

made of sintered steel material, as disclosed by Hayashi et al. ('786) in view of Koehler ('087), in order to lower material wear and prevent premature deformation, as disclosed by Schladitz ('953) (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

Still regarding claim 11, Koehler ('087) discloses that with the addition of graphite, lead and other heavy metals (which would include molybdenum sulfide and/or tungsten sulfide considering Schladitz ('953)), the ring would have an unvaried cross-section along its periphery (col. 1, lines 32-39) which would read on "wherein sulfide inclusions observed in the section of the metal structure, being parallel to the periphery of the piston ring, are distributed such that straight lines each passing through a major axis of the respective sulfide inclusion cross one another within a cross angle of not more than 30 degrees which angles is referred to as a degree of parallelism".

In regards to claim 12, Schladitz ('953) discloses that once the lubricant (graphite, metal sulfide) is expended, sliding properties would deteriorate (col. 1, lines 35-61). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the amount of lubricant in order to prevent premature deterioration of sliding properties. MPEP 2144.05 II.

Still regarding claim 12, Schladitz ('953) discloses that the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

In regards to claim 13, Hayashi et al. ('786) discloses up to 2 weight percent cobalt (col. 4, lines 1-5), which reads on the range of not more than 10 % of Co.

In regards to claims 14-15, Hayashi et al. ('786) does not necessitate the addition of sulfur or calcium. Hayashi et al. ('786) therefore meets the claim limitations of "not more than 0.3% S" and "not more than 0.01% Ca" because "not more than" would include 0%.

In regards to claim 16, Hayashi et al. ('786) discloses subjecting the steel to a nitrogen gas atmosphere at elevated temperature (nitriding) (Examples 1-2).

With respect to the recitations "wherein the steel has been forged, drawn and/or rolled from an ingot" of claim 17 and "wherein the wire material has been annealed and subjected to quenching and tempering" of claim 18, the Examiner notes that the claim is drawn to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. MPEP 2113.

In regards to claims 22-23, Hayashi et al. ('786) discloses 0 to 6 weight percent chromium, which encompasses the ranges of 0 to 0.3 weight percent chromium as in claim 24 and 0 to 0.25 weight percent chromium as in claim 25 (col. 3, line 50 – col. 4,

line 5).

Claims 1, 11, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubota et al. (US 2002/0005616) in view of Schladitz (US 3,343,953).

In regards to claim 1, Kubota et al. ('616) discloses a piston ring comprising a composition relative to that of the instant invention as shown in the table below (abstract, [0048] and [0051]).

Element	From Instant Claims (weight percent)	Kubota et al. ('616) (weight percent)	Overlap (weight percent)
C	0.4 – less than 1.3	0.3 – less than 0.8	0.4 – less than 0.8
Si	0.1 – 3.0	0.1 – 3.0	0.1 – 3.0
Mn	0.1 – 3.0	0.1 – 3.0	0.1 – 3.0
Cr	0 – 0.50	0.3 – 1	0.3 – 0.5
Ni	0.05 – 3.0	0 – 2	0.05 – 2
Al	0.7 – 2.0	0 – 1.5	0.7 – 1.5
Mo+W+V	0.3 – 20	0 – 2.5	0.3 – 2.5
Cu	0.05 – 3.0	0 – 3.0	0.05 – 3.0
Fe	remainder	remainder	remainder

The Examiner notes that the composition disclosed by Kubota et al. ('616) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of carbon, silicon, manganese, chromium, nickel, aluminum, molybdenum, tungsten, vanadium and copper from the amounts disclosed by Kubota et al. ('616) because Kubota et al. ('616) discloses the same utility throughout the disclosed ranges.

Kubota et al. ('616) discloses a piston ring having a composition as shown

in the table above, but Kubota et al. ('616) does not specify "wherein there can be observed graphite particles having an average particle size of not more than 3 μm in a section of a metal structure of a steel.".

Schladitz ('953) discloses inserting metal encapsulated graphite and/or metal encapsulated sulfide into metal interconnections wherein the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron in order to lower material wear and prevent premature deformation (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal encapsulated graphite and/or metal encapsulated sulfide, as disclosed by Schladitz ('953) into the piston ring, as disclosed by Kubota et al. ('616), in order to lower material wear and prevent premature deformation, as disclosed by Schladitz ('953) (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

In regards to claim 11, Kubota et al. ('616) discloses a piston ring comprising a composition relative to that of the instant invention as shown in the table on the following page (abstract, [0048] and [0051]).

Element	From Instant Claims (weight percent)	Kubota et al. ('616) (weight percent)	Overlap (weight percent)
C	0.4 – less than 1.3	0.3 – less than 0.8	0.4 – less than 0.8
Si	0.1 – 3.0	0.1 – 3.0	0.1 – 3.0
Mn	0.1 – 3.0	0.1 – 3.0	0.1 – 3.0
Cr	0 – 0.50	0.3 – 1	0.3 – 0.5
Ni	0.05 – 3.0	0 – 2	0.05 – 2
Al	0.7 – 2.0	0 – 1.5	0.7 – 1.5
Mo+W+V	0.3 – 20	0 – 2.5	0.3 – 2.5
Cu	0.05 – 3.0	0 – 3.0	0.05 – 3.0
Fe	remainder	remainder	remainder

The Examiner notes that the composition disclosed by Kubota et al. ('616) overlaps the composition of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amounts of carbon, silicon, manganese, chromium, nickel, aluminum, molybdenum, tungsten, vanadium and copper from the amounts disclosed by Kubota et al. ('616) because Kubota et al. ('616) discloses the same utility throughout the disclosed ranges.

Kubota et al. ('616) discloses a piston ring having a composition as shown in the table above, but Kubota et al. ('616) does not specify "wherein there can be observed graphite particles having an average particle size of not more than 3 μm in a section of a metal structure of a steel.".

Schladitz ('953) discloses inserting metal encapsulated graphite and/or metal encapsulated sulfide into metal interconnections wherein the metal encapsulated graphite and/or metal encapsulated sulfide would have a thickness of a few microns to about 1 micron in order to lower material wear and prevent

premature deformation (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal encapsulated graphite and/or metal encapsulated sulfide, as disclosed by Schladitz ('953) into the piston ring, as disclosed by Kubota et al. ('616), in order to lower material wear and prevent premature deformation, as disclosed by Schladitz ('953) (col. 1, lines 8-12, col. 1, lines 35-62, col. 2, lines 41-71 and claim 1).

Still regarding claim 11, Kubota et al. ('616) discloses that the sulfide inclusions would be distributed such that the intersecting angle between the maximum size of any one major sulfide inclusion and another major sulfide inclusion would be not more than 30° [0016].

With respect to the amended recitation "0.05 to 3.0% of Cu and S (sulfur)" in line 6 of claim 11, Kubota et al. ('616) discloses that the sulfide (sulfur) inclusions would be distributed such that the intersecting angle between the maximum size of any one major sulfide inclusion and another major sulfide inclusion would be not more than 30° [0016].

In regards to claims 22 and 24, Kubota et al. ('616) discloses 0.3 to 6.0 weight percent chromium [0016], which overlaps the range of 0 to 0.3 weight percent chromium as claimed.

Response to Arguments

Applicant's arguments filed 24 December 2008 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that Hayashi et al. ('786) relates to a process for producing a heat-treated sintered iron alloy part having enhanced strength and hardness and, in particular, excellent dimensional accuracy, by heat treating an iron – based sinter obtained by powder metallurgy with the use of the material in oil pumps. However, while an example in this patent discloses compacting the mixed powder into a ring-shape, there is no disclosure that the material should be used for a piston ring.

In response, the Examiner notes that there is no structural difference between a ring and "a piston ring". A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Second, the Applicant primarily argues that Hayashi et al. ('786) does not describe a piston ring including graphite particles having an average particle size of not more than 3 μm present in a section of the metal structure of the steel.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Third, the Applicant primarily argues that Hayashi et al. ('786) relates to rotors or gears in oil pumps, which have a size of 40 mm of an outer diameter, 27 mm of an inner diameter and 10 mm thickness and in Example 3, there is mentioned on a ring-shaped outer rotor of oil pumps. The Applicant further argues that in the instant invention, piston rings are produced from small wires by bending and these wires have a cross sectional area size on the order of several millimeters whereas Hayashi et al. ('786) discloses a very large ring.

In response, the Examiner notes that there is no structural difference between a ring and "a piston ring". A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Furthermore, merely changing the size of a prior art product is not sufficient to patentably distinguish from that prior art product. MPEP 2144.04 (IV)(A).

Fourth, the Applicant primarily argues that Schladitz ('953) teaches away from incorporating lubricants into a material forming a sliding surface (col. 1, line 28 – col. 2, line 12) and there would be no reason to modify the teachings of Hayashi et al. ('786) to use the material of Hayashi et al. ('786) or Schladitz ('953) as a piston ring.

In response, the Examiner notes that Hayashi et al. ('786) discloses a ring that would be used for oil pumps (col. 1, lines 6-27 and Example I). Schladitz ('953) discloses sintering the lubricant with the structural material having a sliding surface (col. 1, lines 8-12 and col. 2, lines 40-46). The addition of lubricant allows for a longer

product lifetime which is desirable of any product (col. 1, lines 3-62) making the combination of Hayashi et al. ('786) and Schladitz ('953) obvious for the purpose of increasing the product lifetime.

Fifth, the Applicant primarily argues that Kubota et al. ('616) does not disclose a steel having graphite particles having an average particle size of not more than 3 μm present in a section of the metal structure of the steel.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Sixth, the Applicant primarily argues that there would be not reason to modify the teachings of Kubota et al. ('616) or Schladitz ('953) to use the material of Kubota et al. ('616) as a piston ring.

In response, the Examiner notes that Kubota et al. ('616) discloses a piston ring (abstract, [0048] and [0051]). Schladitz ('953) discloses sintering the lubricant with the structural material having a sliding surface (col. 1, lines 8-12 and col. 2, lines 40-46). The addition of lubricant allows for a longer product lifetime which is desirable of any product (col. 1, lines 3-62) making the combination of Kubota et al. ('616) and Schladitz ('953) obvious for the purpose of increasing the product lifetime.

Seventh, the Applicant primarily argues that Kubota et al. ('616) would not have provided any reason to provide a piston ring consisting of a steel including by mass, less than 0.3 weight percent chromium as in claims 22 and 24.

In response, the Examiner notes that Kubota et al. ('616) discloses 0.3 to 6.0 weight percent chromium [0016], which overlaps the range of 0 to 0.3 weight percent chromium as claimed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938.

The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

JR